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NATIONAL DAM SAFETY PROGRAM. MCGHEE DAM (INVENTORY NUMBER VA 10--ETC(U)
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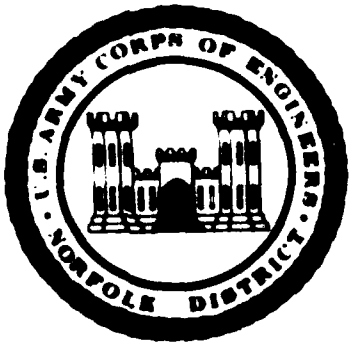
POTOMAC RIVER BASIN

LEVEL I

Name Of Dam: McGHEE
Location: LOUDOUN COUNTY
Inventory Number: VA 10706

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

AD A106328



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NORFOLK, VIRGINIA 23510

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McGhee Loudoun County, VA

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20. Abstract

Pursuant to Public Law 92-367, Phase I Inspection Reports are prepared under guidance contained in the recommended guidelines for safety inspection of dams, published by the Office of Chief of Engineers, Washington, D. C. 20314. The purpose of a Phase I Inspection is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general conditions of the dam is based upon available data and visual inspection. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify the need for such studies.

Based upon the field conditions at the time of the field inspection and all available engineering data, the Phase I report addresses the hydraulic, hydrologic, geologic, geotechnic, and structural aspects of the dam. The engineering techniques employed give a reasonably accurate assessment of the conditions of the dam. It should be realized that certain engineering aspects cannot be fully analyzed during a Phase I inspection. Assessment and remedial measures in the report include the requirements of additional indepth study when necessary.

Phase I reports include project information of the dam appurtenances, all existing engineering data, operational procedures, hydraulic/hydrologic data of the watershed, dam stability, visual inspection report and an assessment including required remedial measures.

POTOMAC RIVER BASIN

NAME OF DAM: McGHEE DAM
LOCATION: LOUDOUN COUNTY, VIRGINIA
INVENTORY NUMBER: VA 10705

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

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PREPARED BY
NORFOLK DISTRICT CORPS OF ENGINEERS
803 FRONT STREET
NORFOLK, VIRGINIA 23510

APRIL 1981

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of the Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the design flood should not be interpreted as necessarily posing a highly inadequate condition. The design flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

BRIEF ASSESSMENT OF DAM

Name of Dam:	McGhee Dam
State:	Virginia
Location:	Loudoun County
USGS Quad Sheet:	Bluemont, Virginia
Stream:	Tributary to Beaverdam Creek
Date of Inspection:	29 April 1981

McGhee Dam is an earthfill structure approximately 450 feet long and 30.6 feet high. The dam is owned and maintained by the Honorable G. C. McGhee, American Ambassador. The dam is classified as a small dam with a significant hazard classification. The principal spillway is a 24-inch concrete pipe located near the right abutment. The emergency spillway is located above the principal spillway pipe and channels flows down the contact between the embankment and right abutment. An 18-inch valve, located at the toe of the dam, is available for dewatering the reservoir. The reservoir is used for recreation.

Based on criteria established by the Department of the Army, Office of the Chief of Engineers (OCE), the Spillway Design Flood (SDF) is the 100-Year Flood. The spillway will pass 20 percent of the PMF or 100 percent of the SDF without overtopping the crest of the dam. The spillways are adjudged as adequate.

The visual inspection revealed no apparent problems and there are no immediate needs for remedial measures. However, the upstream slope and crest width are inadequate and there is no design data or construction history. Maintenance is performed by the owner, but there is no regular maintenance operations program or warning system. It is recommended that the services of a qualified geotechnical engineering firm be engaged to perform a stability check of the dam. This should be completed within 12 months. It is also recommended that a regular maintenance and operations program be instituted with provisions for accurate records of all maintenance performed, and that a warning system be established. The maintenance items listed in Section 7.2 be accomplished as part of the regular maintenance program within the next 12 months.

Submitted By:

Original signed by:
Carl S. Anderson, Jr.

CARL S. ANDERSON, JR.
Acting Chief, Design Branch

Recommended By

Original signed by
JACK G. STARR

JACK G. STARR
Chief, Engineering Division

Approved:

Original signed by:
Douglas L. Haller

DOUGLAS L. HALLER
Colonel Corps of Engineers
Commander and District Engineer

Date: AUG 1 2 1981

DAM

DAM & RESERVOIR

OVERALL VIEWS - McGHEE DAM

29 APRIL 1981

SECTION 1

PROJECT INFORMATION

1.1 GENERAL:

1.1.1 Authority: Public Law 92-367, 8 August 1972, authorized the Secretary of the Army, through the Corps of Engineers to initiate a National Program of Safety Inspections of Dams throughout the United States. The Norfolk District has been assigned the responsibility of supervising the inspection of dams in the Commonwealth of Virginia.

1.1.2 Purpose of Inspection: The purpose is to conduct a Phase I inspection according to the Recommended Guidelines for Safety Inspection of Dams (Reference 1, Appendix IV). The main responsibility is to expeditiously identify those dams which may be a potential hazard to human life or property.

1.2 Project Description:

1.2.1 Dam and Appurtenances: McGhee Dam is an earthfill structure about 450 feet long and 36.6 feet high. The crest of the dam is 13 feet wide with a crest elevation 429.0 feet msl. The upstream slope is 1.5 horizontal to 1 vertical (1.5H:1V) and the downstream slope is (2.5H:1V).

It is unknown if the dam is keyed into the foundation or whether or not there is a drainage system. There are no foundation drain outlets. There is no riprap on the dam.

The principal spillway is a 24-inch concrete pipe with an intake invert elevation of 425.3. Due to rocks and dirt built up in the approach channel, the water level must be approximately 426.0 before any flow will occur. The pipe slopes down the contact between the embankment and the right abutment and discharges at approximately elevation 415.0. The discharge cascades down the slope over large rocks and boulders.

The emergency spillway is an open channel (low point across the crest of the dam) located above the principal spillway. The crest of the emergency spillway is 427.0. A concrete wing wall, protecting the principal spillway pipe, prevents high pool levels from eroding the emergency spillway crest.

An 18 inch pipe, located at the bottom the the reservoir, can dewater the reservoir by operation of a valve located at the downstream toe of the dam.

1.2.2 Location: McGhee Dam is located about 1.5 miles northeast of Leesburg, Virginia in Loudoun County.

1.2.3 Size Classification: The dam is classified as a small dam as defined in Reference 1 of Appendix IV.

1.2.4 Hazard Classification: The dam is located upstream of [illegible] homes located on Beaverdam Creek. Should a dam failure occur, [illegible] could sustain damages with a possibility of loss of life. [illegible] significant hazard classification is given for the McGhee Dam [illegible] to guidelines contained in Section 2.1.[illegible] of Reference [illegible], Appendix [illegible]. The hazard classification used to categorize a dam is a function of location only and has nothing to do with its stability [illegible] failure.

1.2.5 Ownership: The Honorable [illegible] McGhee, [illegible]

1.2.6 Purpose: The reservoir has been used for [illegible] limited recreation.

1.2.7 Design and Construction History: The Loudoun [illegible] Conservation Service agent supervised the building of McGhee Dam. [illegible] dam was constructed in 1951 in accordance with specifications [illegible] the Loudoun County Soil Conservation Service [illegible] supervision. The present principal spillway was placed [illegible] abutment in the Fall of 1979 to replace the deteriorated [illegible] principal spillway.

1.2.8 Normal Operational Procedures: [illegible] McGhee Dam is automatic with water passing [illegible] emergency spillways as the reservoir rises [illegible] respectively.

1.3 Pertinent Data:

1.3.1 Drainage Area: [illegible]

1.3.2 Discharge at Dam Site: [illegible]

Pool level at crest of dam.

Emergency Spillway . . . . [illegible]

1.3.3 Dam and Reservoir Data: Pertinent data [illegible] reservoir are shown in the following table.

TABLE 1.1 DAM AND RESERVOIR DATA

Item	Elevation feet [illegible]	Area acres	Reservoir Capacity: Acre feet	Reservoir Capacity: [illegible]
Crest of Dam	[illegible]	[illegible]	[illegible]	[illegible]
Emergency Spillway	[illegible]	[illegible]	[illegible]	[illegible]
Bottom Pool	[illegible]	[illegible]		[illegible]
Streambed at Down-stream toe of dam	[illegible]			

SECTION 2

ENGINEERING DATA

2.1 Design. There is no known design data.

2.2 Construction. There are no known construction records. The owner of the dam was interviewed, by correspondence, that the dam was built in accordance with specifications provided by the Loudoun County Soil Conservation Service and under their supervision. Mr. Calvin Lloyd, the owner's daughter, stated during the inspection that the dam site was inspected and the design reviewed by the SCS. He also stated that the original principal spillway was damaged by ice and that a cutoff was placed on the original outlet pipe in order to hold water [illegible] was principal spillway was then constructed by placing a new concrete pipe through the right abutment.

2.3 [illegible] there is insufficient information to evaluate [illegible] embankment stability.

SECTION 3

VISUAL INSPECTION

3.1 Findings

3.1.1 General. The results of the 19 April [illegible] inspection are recorded in Appendix III. At the time of the inspection the weather was overcast. The temperature was 25° and the ground was [illegible]. The pool elevation was about 420 feet msl. Another pool elevation and the tailwater was at approximately 39[illegible] feet msl. [illegible] inspection reports.

3.1.2 Embankment. The embankment is in [illegible] condition. A sketch showing a plan view, a profile of the crest, and a cross section are provided in Appendix I. An overall view of the [illegible] at the beginning of the report.

There are no signs of surface cracks, [illegible] misalignment. However, there are [illegible] cattle foot prints on the crest of the dam. Several areas of the upstream face [illegible] where cattle have walked down to the reservoir. Deep cattle foot prints are prevalent on the downstream face. A small [illegible] on the downstream face about twenty feet left of the principal spillway outlet pipe. A footpath runs down the downstream left abutment [illegible] the midpoint of the downstream face where it runs across the embankment to the right abutment (See Plate II, Appendix I and Photos No. [illegible], Appendix III).

There is a seep in the lower portion of the downstream left abutment contact (See Plate II, Appendix III). Flow is 2 gpm and clear. The flow runs down the left abutment and across the downstream toe to the [illegible] stilling basin where water is ponded (See Photo No. 7, Appendix III). The owner has indicated that this seep is actually a spring intercepting the building of the dam.

There are no known embankment drains.

According to the owner's caretaker, the materials for the embankment were taken from the reservoir area. Area soils are fine to medium sand (SM) and (35%-50%) clayey silt.

The upstream face is well vegetated with grass and large shrubs with the exception of the previously mentioned eroded areas. The upper half of the downstream face is covered with grass and scattered shrubs. The lower half of the downstream face is covered with large shrubs (See the overview photos at the beginning of the report, Plate II, Appendix I, and Photos No. 1 & 4, Appendix III).

3.1.3 Outlet Works The principal spillway is a 24 inch concrete pipe placed in the right abutment. The pipe slopes slightly down the abutment. The invert of the intake is 0.7 feet below the existing pool. The emergency gate is a valve placed on the old principal spillway outlet pipe. The owner's caretaker reported that the pipe was approximately inches. The valve stem is covered by hay and tree limbs to keep cattle from damaging it. The valve was operated to lower the reservoir when the new principal spillway was installed (See Plate II, Appendix I and Plate No. 5 & 6, Appendix II).

3.1.4 Emergency Spillway The low area of the right abutment is considered to be the control section of the emergency spillway. The principal spillway placed in the right abutment area is the control section. The fill placed over the principal spillway contains almost no vegetation. The approach channel is the same as that for the principal spillway. The discharge channel overlaps the principal spillway discharge channel. Some trees and shrubs line the lower part of the discharge channel.

3.1.5 Instrumentation There is no instrumentation on the dam.

3.1.6 Reservoir Area The reservoir slopes are gentle with [illegible] The land being pastureland. There is some slope erosion around the reservoir but no signs of reservoir slope failure. The inspection team was unable to evaluate sedimentation in the reservoir.

3.1.7 Downstream Channel The downstream channel is tree lined and overgrown with vegetation. The channel bends to the right about 400 feet downstream of the dam. The flood plain is about 100 feet wide with steep grassy, wooded side slopes. There are two homes and State Route 734 about 1.3 miles downstream on Beaverdam Creek.

3.2 Evaluation Overall the dam appears in good condition. The visual inspection revealed certain preventative maintenance items which should be scheduled as part of an annual maintenance program. These are

a. The tire ruts, eroded areas, hoof prints, and animal burrows should be filled with compacted material and seeded.

b. The footpath should be reseeded.

c. A fence should be placed at the top of each slope on the crest to keep cattle off the embankment slopes.

d. Two inches of gravel should be placed on the roadway on the crest.

e. The seep/spring on the downstream left abutment should be monitored during periodic inspection for any increase in flow or turbidity. If any increase in flow and turbidity is found without an explanation, the services of a geotechnical engineer should be obtained to investigate the causes of the increases.

SECTION 4

OPERATIONAL PROCEDURES

4.1 Procedures. The normal storage pool elevation [illegible] is the pool level in which flows pass into the principal spillway. [illegible] the pool rises significantly to fill the area of the approach [illegible], flow will pass over the crest of the emergency spillway just above elevation [illegible]. An 18 inch valve [illegible] operated [illegible].

4.2 Maintenance. [illegible] as needed [illegible] the caretaker living [illegible].

4.3 Warning System. At present time [illegible] evacuation plan for [illegible] Dam.

4.4 Evaluation. [illegible] and maintenance procedures. However, the present maintenance [illegible] expanded and documented. An emergency [illegible] should be developed. It is recommended that formal emergency procedures [illegible]

[illegible]

[illegible]

SECTION 5

HYDRAULIC/HYDROLOGIC DATA

5.1 Design [illegible]: None were available.

5.2 Hydrologic Information: None were available.

5.3 Flood Experience: The maximum flood at the dam is not known.

5.4 Flood Potential: The 100 year flood, 1/2 PMF and PMF were developed and routed through the reservoir by use of the HEC-1DB computer program [illegible] Appendix IV [illegible] appropriate unit hydrographs, precipitation and storage outflow data. Clark's Tc and R coefficients for the [illegible] drainage area were estimated from basin characteristics. The rainfall applied to the developed unit hydrographs was obtained from the [illegible] Weather Bureau publications Reference [illegible] of Appendix IV.

5.5 Reservoir Regulation: Pertinent dam and reservoir data is shown [illegible].

5.6 [illegible] curve was developed based on [illegible] obtained from [illegible] Survey [illegible] Map [illegible] data taken during the [illegible] to the [illegible], Virginia Quadrangle Map [illegible] storage data. Rating curves for the non-overflow section [illegible] spillway were developed by hand calculation. In routing hydrographs through the reservoir, it was assumed that the [illegible] elevation [illegible]. Flow through the principal spillway was [illegible].

5.7 Overtopping Potential: The probable rise in the reservoir [illegible] summation of reservoir performance is shown in the following ta[illegible]

Table 5.1 RESERVOIR PERFORMANCE

Item	Normal Flow	100 1/ Year	1/2 PMF	PMF 2/
Peak flow c.f.s.				
Inflow	1	656	1761	3522
Outflow	1	446	1660	3410
Maximum elevation ft. msl	426.0	428.8	429.7	430.4
Non-overflow section (elevation 429.0)				
Depth of flow, ft.	-	-	.7	1.4
Duration, hrs.	-	-	2.0	3.5
Velocity, fps 3/	-	-	3.8	5.4
Tailwater elevation ft. msl	-	392.4±	-	-

1/ The 100-Year Flood has one chance in 100 of occurring in any given year.

2/ The PMF is an estimate of flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region.

3/ Critical Velocity

5.7 Reservoir Emptying Potential: A 18-inch diameter pipe is available to dewater the reservoir. With the reservoir at normal pool (elevation 426.0), the pipe is capable of a discharge flow of 47.5 cfs and dewater the reservoir in about 2.5 days. This is an equivalent drawdown rate of 13.8 feet per day. This is based on the hydraulic height of the dam divided by the time to dewater the reservoir.

5.8 Evaluation: Based on the size (small) and hazard classification (significant), the recommended Spillway Design Flood is the 100-Year Flood to the 1/2 PMF. Because of the risk involved, the 100-Year Flood has been selected as the SDF. The emergency spillway will pass 20 percent of the PMF or 100 percent of the SDF without overtopping the crest of the dam.

Conclusions pertain to present day conditions. The effect of future development on the hydrology has not been considered.

SECTION 6

DAM STABILITY

6.1 Foundation and Abutments: There is no detailed information available on the foundation conditions. The dam is located within the Blue Ridge physiographic Province of Virginia. Drainage in the area is eastward into the Potomac River. According to Reference No. 3, the dam is located on the contact of the Precambrian Marshall Formation and the Cambrian-Precambrian Swift Run Formation. Outcrops in the area tend to support this. A sample taken from an outcrop on the right abutment was composed of a granite pegmatite. The Marshall Formation locally consists of granites and granodiorites. Samples from the left abutment were representative of the Swift Run. A sample of a chlorite phyllite, light to dark green, weathered to a tan-light brown, was taken from the left abutment. One hundred feet upstream on the left abutment, an outcrop was found which consisted of a hornblende schist/gneiss. The predominate foundation material are relatively pervious, stable, fine silty sands. As noted in the visual inspection, there is a seep located on the downstream left abutment. Since the visual inspection on 29 April 1981, correspondence by the owner has indicated that this seep is actually a spring antedating the construction of the dam. It is unknown if the dam is keyed into the foundation or if there are any foundation drains. There are no foundation drain outlets.

6.2 Embankment: The owner's caretaker stated that the embankment materials came from the reservoir area. There is no information available on the nature of the material. Area soils are (SM) fine to medium sand and clayey silt.

6.2.1 Stability: There are no available stability calculations. The dam is 36.0 feet high and 13 feet wide. The upstream slope is 1.5H:1V and the downstream slope is 2.5H:1V. The dam is subject to sudden drawdown because the approximate drawdown rate of 13.8 feet per day exceeds the critical rate of 0.5 feet per day for earth dams. It is unknown if the dam has experienced the maximum control storage pool which is at the elevation of the emergency spillway (1.0 feet above normal pool).

According to the guidelines presented in Design of Small Dams, U.S. Department of the Interior, Bureau of Reclamation for small homogenous dams, with a stable foundation, subject to a sudden drawdown and composed of silty sands (SM), the recommended slopes are 3.0H:1V upstream and 2.0H:1V downstream. The recommended width is 18 feet. Based on these guidelines, the dam has an adequate downstream slope and an inadequate upstream slope and crest width.

6.2.3 Seismic Stability: The dam is located in Seismic Zone 2. Therefore, according to the Recommended Guidelines for Safety Inspection of Dams, the dam is considered to have no hazard from earthquakes provided static stability conditions are satisfactory and conventional safety margins exist.

6.2.4 Evaluation: There is insufficient information to adequately evaluate the stability of the dam. Overtopping is not a problem. It is recommended that the service of a qualified geotechnical engineering firm be engaged to perform a stability check on the dam because of the lack of design data and construction history, and the inadequate upstream slope and crest width. This should be completed within 12 months.

SECTION 7

ASSESSMENT/REMEDIAL MEASURES

7.1 Dam Assessment: The available engineering data is insufficient to evaluate the embankment stability. The visual inspection revealed no findings to prove the dam unsound. The dam is maintained by the owner. However, there is no regular maintenance operations program or emergency operations and warning plan. Based on criteria established by the Department of the Army, Office of the Chief of Engineers (OCE), the Spillway Design Flood (SDF) is the 100-Year Flood. The spillways will pass 20 percent of the PMF or 100 percent of the SDF without overtopping the dam. The spillways are adjudged as adequate. Overall the dam is in good condition and there is no immediate need for remedial measures. However, a stability check is required due to the inadequate upstream slope and crest width, and the lack of design data and construction history.

7.2 Recommended Remedial Measures: It is recommended that the services of a qualified geotechnical engineering firm be engaged to perform a stability check of the dam. This should be completed within 12 months. A regular maintenance operations program should be initiated to help detect and control problems as they occur. A formal emergency procedure should be prepared, and furnished to all operating personnel. This should include how to operate the dam during an emergency, and who to notify, including public officials, in case evacuation from the downstream area is necessary. Also, the inspection revealed the following maintenance items that should be scheduled by the owner during a regular maintenance period within the next 12 months:

a. The tire ruts, eroded areas, hoof prints, and animal burrows should be filled with compacted material and seeded.

b. The footpath should be reseeded.

c. A fence should be placed at the top of each slope on the crest to keep cattle off the embankment slopes.

d. Two inches of gravel should be placed on the roadway on the crest.

e. The seep/spring on the downstream left abutment should be monitored during periodic inspection for any increase in flow or turbitity. If any increase in flow and turbitity is found without an explanation, the services of a geotechnical engineer should be obtained to investigate the causes of the increases.

f. The shrubs on the face of the dam should be cut off at their roots.

g. The emergency spillway should be seeded.

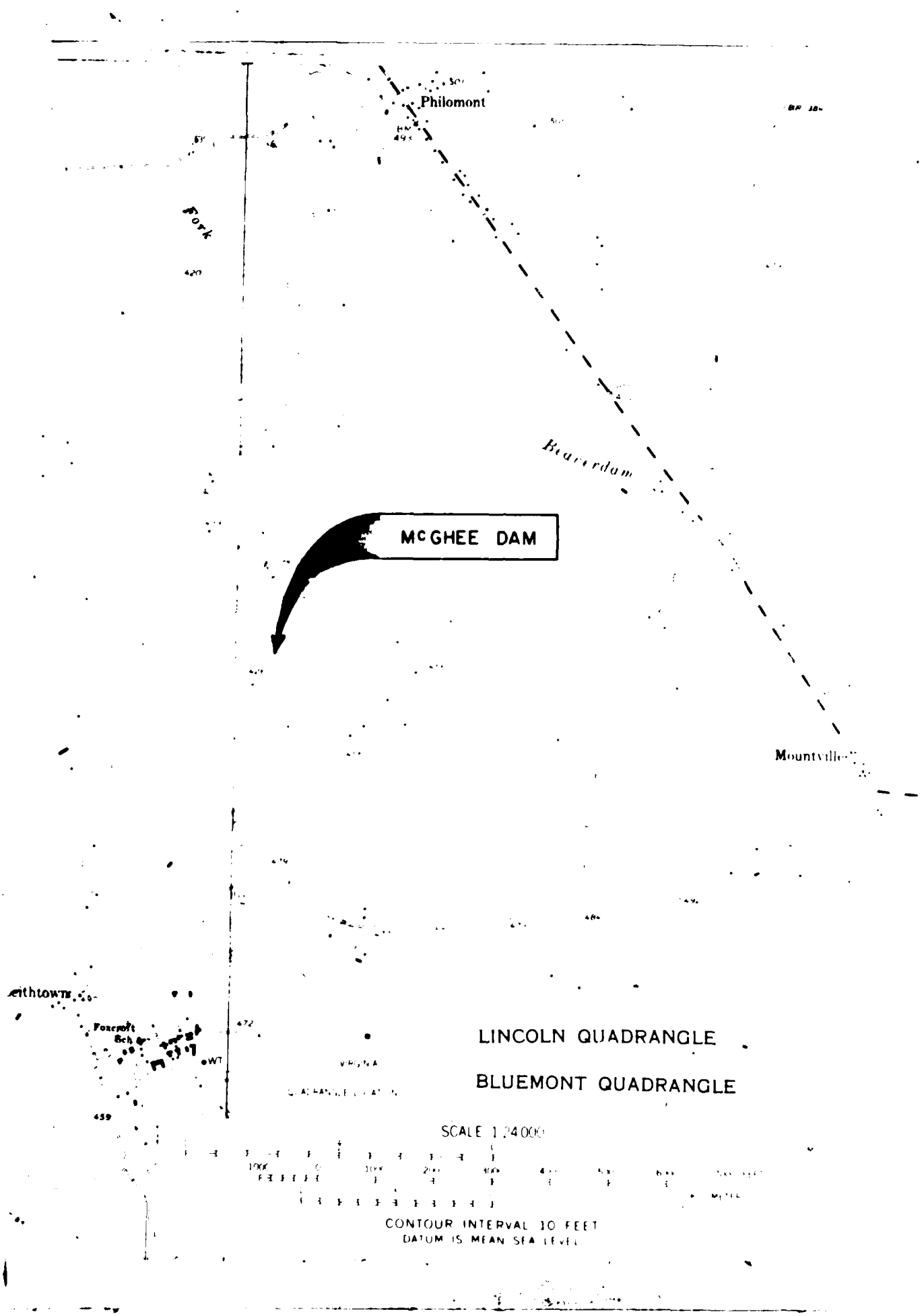
h. The trees and shrubs that would obstruct excess flow in the discharge channel of the emergency spillway should be removed.

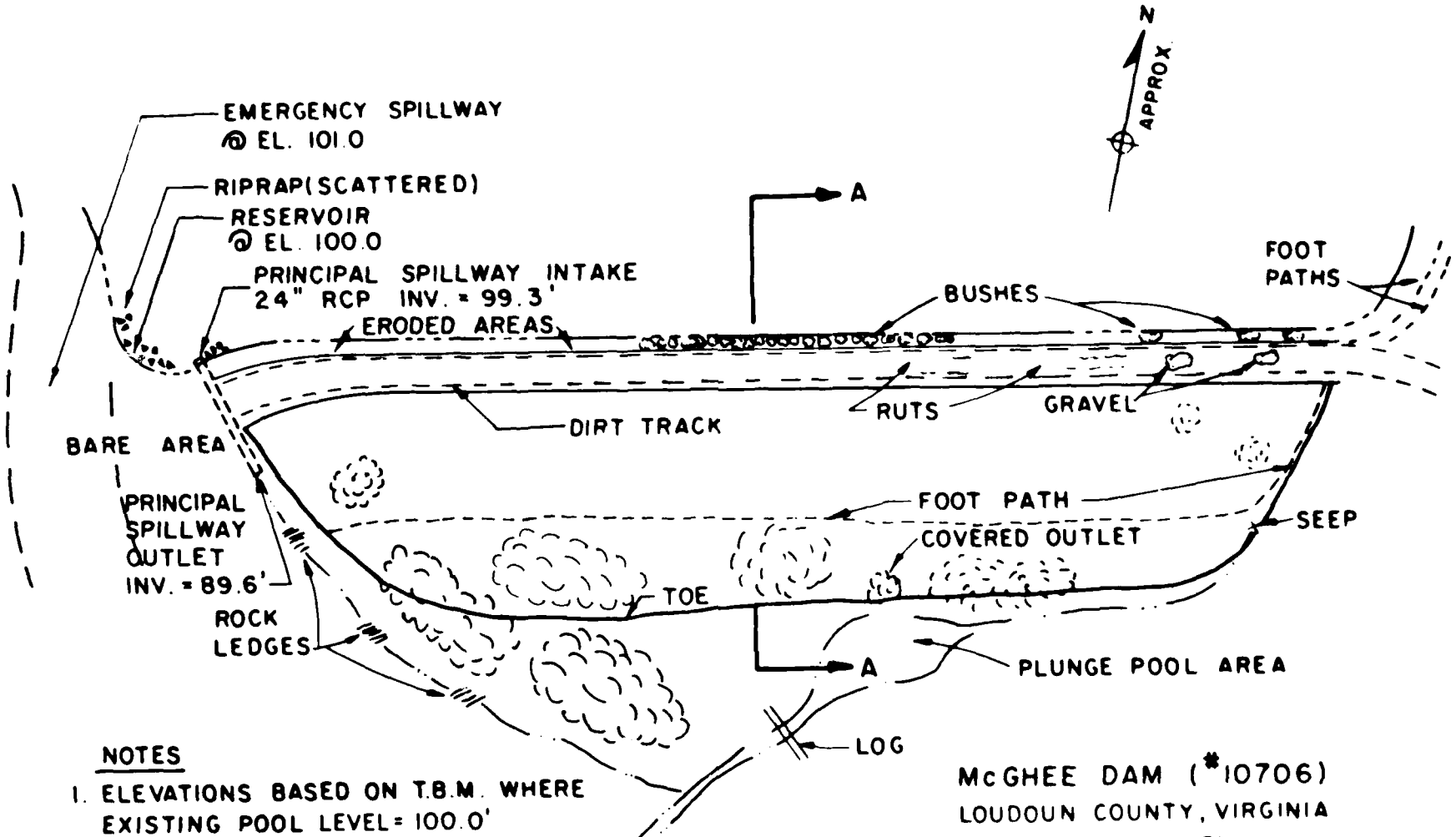
i. A staffgage should be installed in the reservoir to extend above the crest of the dam.

j. Trees and debris that impede flow in the downstream channel should be removed.

APPENDIX I

MAPS AND DRAWINGS


Philomont
Fork
Beaverdam
McGHEE DAM
Mountville
LINCOLN QUADRANGLE
BLUEMONT QUADRANGLE
SCALE 1:24000
CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL



NOTES

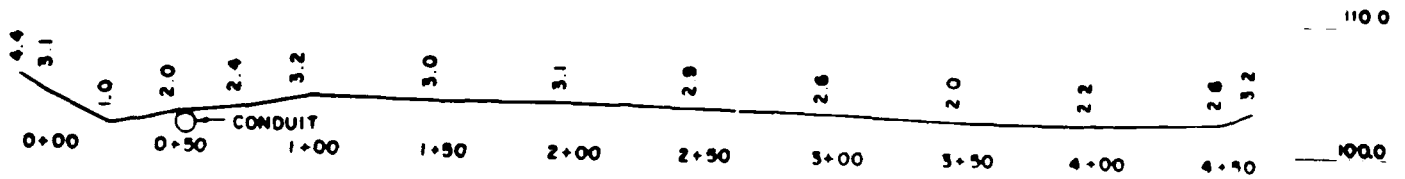
1. ELEVATIONS BASED ON T.B.M. WHERE EXISTING POOL LEVEL = 100.0'
2. SKETCH MADE FROM FIELD NOTES

McGHEE DAM (*10706)
LOUDOUN COUNTY, VIRGINIA
29 APRIL 1981

PLAN VIEW OF THE DAM

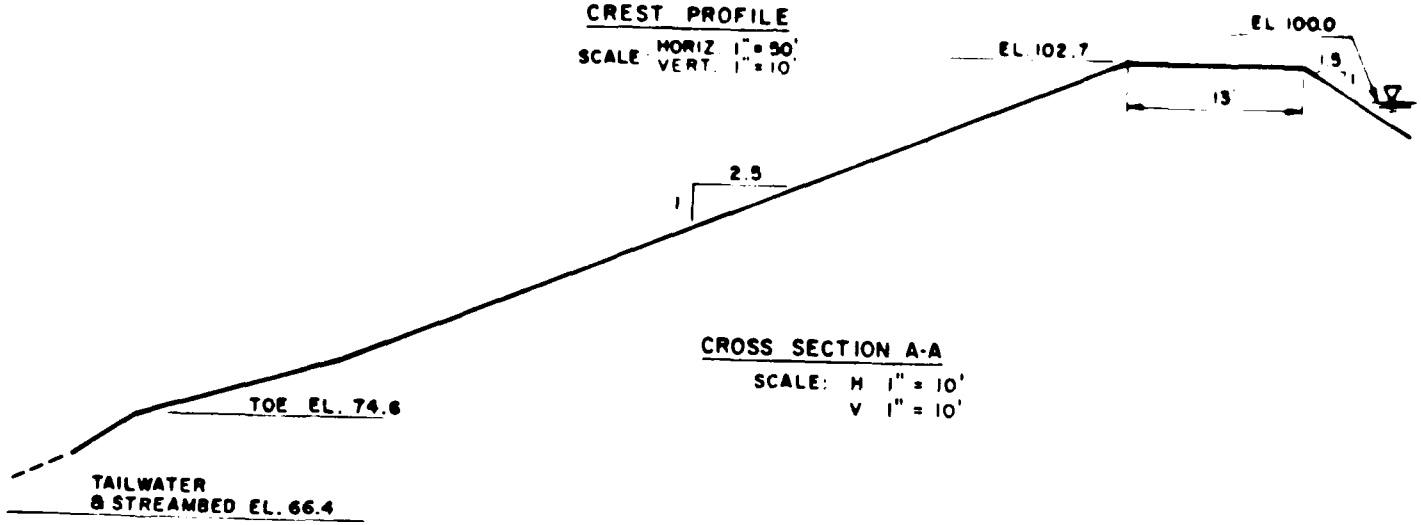
SCALE : 1" = 50'

PLATE II



CREST PROFILE

SCALE: HORIZ 1" = 50'
VERT. 1" = 10'



CROSS SECTION A-A

SCALE: H 1" = 10'
V 1" = 10'

McGHEE DAM (#10706)
LOUDOUN COUNTY, VIRGINIA
29 APRIL 1981

PLATE III

APPENDIX II

PHOTOGRAPHS

PHOTO #1 CREST OF DAM

PHOTO #2 RUTTING OF CREST OF DAM

PHOTO #3 ANIMAL TRAFFIC EROSION NEAR THE CREST ON THE UPSTREAM FACE

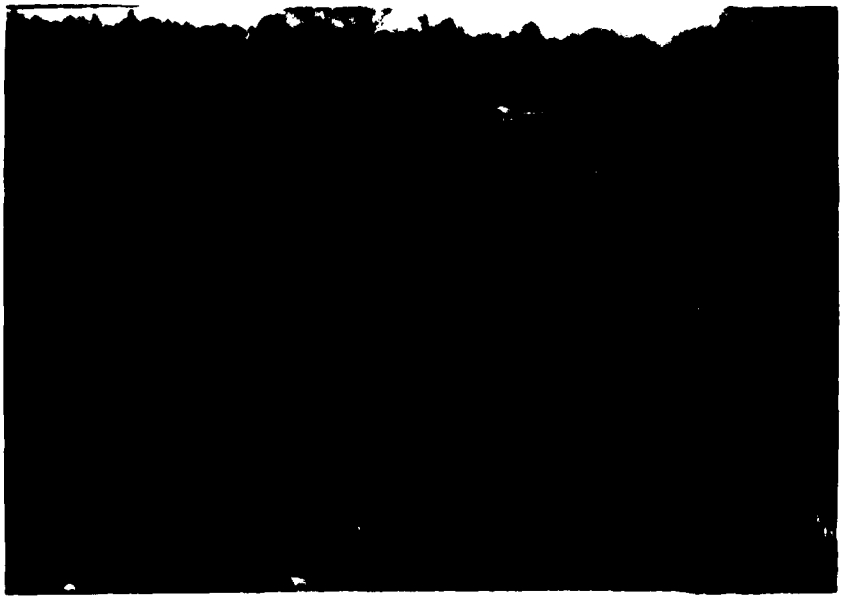


PHOTO #4 DOWNSTREAM FACE

PHOTO #5 PRINCIPAL SPILLWAY INTAKE (ALSO APPROACH CHANNEL FOR EMERGENCY SPILLWAY)

PHOTO #6 PRINCIPAL SPILLWAY OUTLET

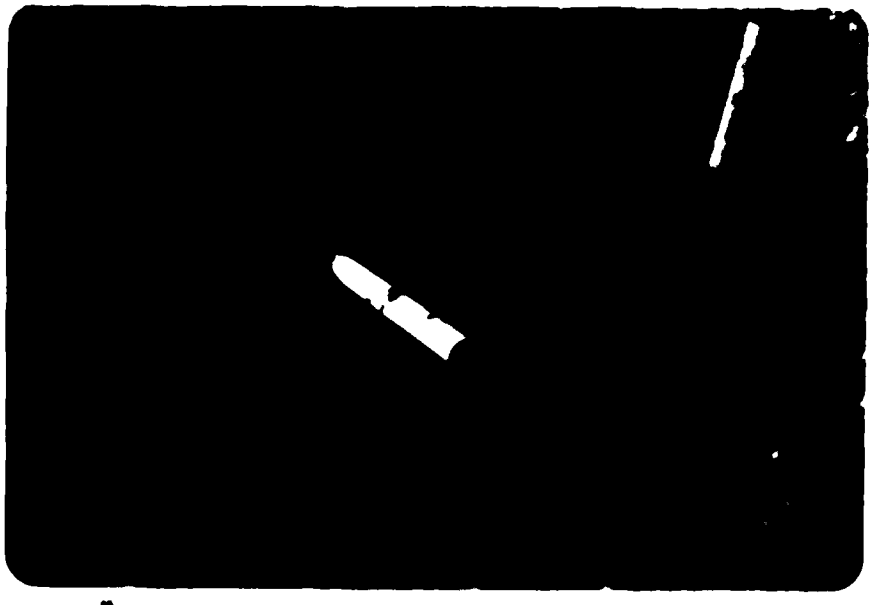


PHOTO #7 INTERCEPTED FLOW FROM SPRING/SEEP AT TOE OF CONTACT OF LEFT ABUTMENT AND EMBANKMENT

PHOTO #8 DOWNSTREAM CHANNEL

APPENDIX III

FIELD OBSERVATIONS

Check List
Visual Inspection
Phase I

Name Dam: McGhee County: Loundoun State: Virginia Coordinates: Lat 39° 01.7' N
Long 77° 45.0' W

Date of Inspection: 29 April 1981 Weather: Overcast Temperature: 78°F.

Pool Elevation at Time of Inspection: 426+ Tailwater at Time of Inspection: 392.4+

Inspection Personnel:

B. O. Taran, Corps of Engineers
Leonard Jones, Corps of Engineers
James Robinson, Corps of Engineers
Daniel Davis, Corps of Engineers
H. Gildea, State Water Control Board
Mr. Calvin Lloyd, Caretaker

Davis and Robinson Recorders

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	There are no surface cracks. Ground conditions are moist.	None.
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	There are no creep, sloughing, or bearing capacity problems.	None.
SLOUGHING OR EROSION OF EMBNKMENT AND ABUTMENT SLOPES	Tire ruts and deep cattle hoof prints exit on the crest of the dam causing ponding of surface water and generally muddy conditions. Several areas on the upstream face are eroded where cattle have walked down to the reservoir. Deep cattle hoof prints are prevalent on the downstream face. A small animal burrow is located on the downstream face approximately twenty feet left of the principal spillway outlet pipe. A footpath runs down the downstream left abutment to about the midpoint of the downstream face where it runs across the embankment to the right abutment.	The tire ruts, eroded areas, hoof prints, and animal burrow should be filled with compacted material and seeded. The footpath should be reseeded. A fence should be placed at the top of each slope on the crest of the dam to keep cattle off of the embankment slopes.
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	The crest serves as a dirt road and its alignment is straight.	One to two inches of gravel. should be placed on the roadway.
RIPRAP	There is no riprap on the dam.	None.

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
FOUNDATION	There is no noticeable sliding or settlement. Several outcrops are in the area. There are no known foundation drains.	None.
ANY NOTICEABLE SEEPAGE	There is a seep located in the lower portion of the downstream left abutment contact. Flow is 2 gpm and is clear. The flow runs down the left abutment and across the downstream stilling basin where water is ponded. (Since the onsite inspection on 29 April 1981, correspondence by the owner indicate that this seep is actually a spring antedating the construction of the dam).	The wet area should be monitored for any increase in flows during periodic inspections. If any increase in flow or turbitity is found without an explanation the services of a geotechnical engineer should be obtained to investigate the causes of the increases.
DRAINS	There are no known embankment drains.	None.
MATERIALS	According to the caretaker, materials for the embankment were taken from the reservoir area. Area soils are (SM) fine to medium sand and clayey silt.	None.
VEGETATION	With the exception of the previously mentioned eroded areas the upstream face is vegetated with grass and several large briar bushes. The upper half downstream face is covered with grass and scattered shrubs. The lower half of the downstream face is covered with large briar bushes.	The bushes and shrubs should be cut off at their roots.
OTHER	The caretaker stated that the dam was built under the supervision of the S.C.S.	None

PRINCIPAL SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATION
CONTROL SECTIONS	The principal spillway is a 24-inch concrete pipe placed in the right abutment. The pipe slopes slightly down the abutment. The invert of the intake end of the pipe is about 0.7 feet below the normal pool.	None.
APPROACH CHANNEL	The approach channel slopes slightly from the reservoir pool to the invert of the intake pipe. The area is cluttered with small stones.	None.
DISCHARGE CHANNEL	The discharge channel is rock lined and runs along the right abutment. There is no debris in the channel.	None.
EMERGENCY GATE	The emergency gate valve located at the toe of the dam is covered by hay and tree limbs to prevent cattle from damaging it. The intake is located at the bottom of the original principal spillway that was damaged during an ice thaw. The caretaker reported the size of pipe to be approximately 18-inches. The valve was operated to lower the reservoir when the new principal spillway was installed.	None.

EMERGENCY SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATION
CONTROL SECTIONS	A low area of the dam crest at the right abutment is considered the control section of the emergency spillway. The new principal spillway placed in the right abutment lies below the control section. The fill dirt placed over the principal spillway contains almost no vegetation.	A good grass cover is recommended.
APPROACH CHANNEL	The approach channel is the same as that for the principal spillway. There is a concrete wing wall protecting the principal spillway and about 1/2 the emergency spillway control section.	None.
DISCHARGE CHANNEL	The discharge channel overlaps the principal spillway discharge channel. Some trees and shrubs line the lower portion of the discharge channel and the downstream channel.	None.

INSTRUMENTATION

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATION
MONUMENTATION/SURVEYS	There are no known monuments in the immediate area.	None.
OBSERVATION WELLS	There are no observation wells.	None.
WEIRS	There are no weirs.	None.
PIEZOMETERS	There are no piezometers.	None.
STAFFGAGES	There are no staffgages.	A staffgage should be installed to extend above the crest of the dam.

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	The reservoir slopes are gentle with a majority of the land, pastureland. There is minor shoreline erosion around the reservoir but not bad enough to cause problems. This erosion is caused by wave action in the reservoir.	None.
SEDIMENTATION	The inspection team was unable to evaluate sedimentation in the reservoir.	None.

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.	The downstream channel is tree lined and [illegible] with debris. The channel bends to the right at 300 feet downstream of the dam. The channel is about 100 feet wide and deep.	In the case of an extreme flood the trees in the flood plain will obstruct flow from the dams. It would be beneficial to cut down trees that would impede flow in the stream channel and remove the debris from the downstream area.
SLOPES	The slopes are steep and heavily wooded.	None.
APPROXIMATE NO. OF HOMES AND POPULATION	There are two homes and State Route 734 about 1.5 miles downstream of the dam on Beaverdam Creek. The homes appear to be less than 20 feet above the creek.	None.

APPENDIX IV

REFERENCES

REFERENCES

1. Recommended Guidelines for Safety Inspection of Dams, Office of the Chief of Engineers, Department of the Army, Washington, D. C.

2. HEC-1DB Flood Hydrograph Package, (Hydrologic Engineering Center, U. S. Army Corps of Engineers, September 1978.)

3. "Probable Maximum Precipitation Estimates, United States East of the 105th Meridian," Hydrometeorological Report No. 51, (U. S. Weather Bureau, June 1978).

4. "Rainfall Frequency Atlas of the Unites States", Technical Paper No. 40, (U.S. Weather Bureau, May 1961).

5. "Design of Small Dams", Technical Publication of United States Department of the Interior, Bureau of Reclamation, Second Edition, Revised Reprint, 1977.

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